APPENDIX A

RECLAMATION COST ESTIMATE CALCULATIONS

The preparation of reclamation cost estimates is a step-by-step process for calculating the amount of financial assurances necessary to perform site reclamation. The calculation will differ between locations based on the tasks necessary to implement the approved reclamation plan.

In response to inquiries from lead agencies and mine operators for guidance, the following Example of a Financial Assurance Cost Estimate calculation work sheet is offered. This information is provided as a guideline only. The work sheets are not to be interpreted by lead agencies or mine operators as a mandatory format for estimating reclamation costs.

Although an individual mining operation may encounter conditions not listed on the work sheets, through the application of basic estimating principles, most tasks can be broken down into component parts, and simplified. The following methodology (or one similar) may be considered in the development of reclamation cost estimates. The idea is to simplify the tasks and provide justification for the listed costs; merely listing the costs is not adequate.

- Describe the task to be performed. Examples would include: spoil grading, highwall reduction, revegetation, etc. Following the identification of broad reclamation categories, the component parts of these tasks should be identified. For example, revegetation may include seed bed preparation, seeding and fertilizing, irrigation and weed control. Each of these subtasks should be estimated individually to simplify the overall process. Where grading of a pit area is part of the reclamation plan, it is recommended that cross-sections and maps of pit areas be used to justify grading quantities.

- Identify the equipment necessary to complete the proposed task.

- Identify the labor requirements.

- Identify the materials to be used.

- Define each of the unit costs.

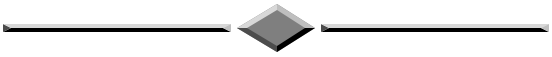
- Calculate Production Rates.

✍✍Multiply the Unit Cost (e.g. $/hr) by Production Rate (e.g. cubic yards/hr) to determine the total cost for each cost item (e.g. Scrapers). Add the costs for all cost items to find the total cost per category (e.g. Equipment).

✍✍Add Total Cost of all categories (i.e. Equipment. Labor, Materials, etc.) to determine the Total Direct Cost of reclamation.

✍✍Add charges for Supervision, Profit, Overhead, Contingencies and Mobilization.

A number of cost estimating manuals are available to assist you with the preparation of your financial assurance cost estimates. These manuals are available in government and technical book stores. It is often helpful to rely on a variety of sources, as not all categories are clearly defined and tin some cases they are not listed at all. Personal experience can be a good indicator of the actual cost of performing certain tasks; however, the estimator should endeavor to provide justification for all listed costs.



Following is a list of references that may be helpful in calculating reclamation bond estimates:

1. ***The Cost Estimating Guide for Road Construction***, 1988, USDA Forest Service, Intermountain Region, 324 25th Street, Ogden, UT 84401. This publication contains information on road obliteration, earth moving, equipment rental, and wage rates. It is important to remember that equipment rental and wage rates vary, both geographically and with time. In determining labor rates and heavy equipment costs, local rates or rates prevailing in the area of the nearest source should be used.
2. ***The Cost Reference Guide for Construction Equipment***, 1988, The Equipment Guide Book Company (commonly referred to as "The Blue Book"). This lists guidelines for calculating equipment performance and costs per unit of material removed.
3. ***The Mine Cost Service***, 1989, Western Mine Engineering, P. O. Box 9008, Spokane, WA 99209. This publication lists prices and costs for labor, equipment, supplies, transportation, etc. Most Regional Office Mineral Staffs and Mineral Examiners have updated copies and are available to assist in providing helpful information and data for mineral operation costs.
4. ***The Mineral Industry Costs***, 1977 & 1981, Northwest Mining Association, 633 Peyton Building, Spokane, WA 99201. These publications provide data on Time, Risk Factors, Costs, Assessing Costs, and Estimating Various Project Costs. The costs are in 1980 dollars and an adjustment of 1980 dollars to current dollars must be made. Most Mining Engineers and Geologists can supply the factor needed to make the conversion.
5. ***Means Heavy Construction Cost Data, 6th Annual Edition***, 1992, R. S. Means Company, Inc., Construction Consultants and Publisher, 100 Construction Plaza, P. O. Box 800, Kingston, MA 02364-0800. Telephone (617) 585-7880. The manual provides current

equipment and labor rates for a variety of heavy construction activities. This manual is difficult for the beginning estimator to use; however, through practice and familiarity, most tasks can be estimated with a reasonable expectation of accuracy. If questions arise concerning the location or application of certain construction activities, the estimating department will assist with questions by telephone.

6. ***Handbook for Calculation of Reclamation Bond Amounts***, 1987, United States Department of the Interior, Office of Surface Mining Reclamation and Enforcement, 1951 Constitution Avenue NW, Washington, D. C., 20240. This handbook provides an array of examples for estimating common mining reclamation activities. The publication is not recommended for use by the beginning estimator. Proper application of the concepts illustrated requires advanced estimating and technical skills.
7. ***Caterpillar Performance Handbook***, 1991, Caterpillar Inc., Peoria, IL. This handbook lists the equipment specifications and production capabilities of all Caterpillar equipment. It is particularly useful for identifying equipment capabilities, various modifications and production rates.